CLAIMS

1. Method for measuring forces and moments acting on a body, characterised in that it comprises the application onto the said body (11) of a measuring structure (12), comprising one or more elements, connected together through a plurality of connection elements or bindings (17, 18, 37) in a statically determined or else statically non determined way; said body (11) being stressed by generalised forces described by the vector $F_g = [F_x\ F_y\ F_z\ T_x\ T_y\ T_z]$, to be determined, F_g being defined by the components along three coordinated axes of the generalised external forces (a moment vector T and a force vector F orientated in any way), said vector F_g being obtained by measuring on said measuring structure (12) six magnitudes in one or more points, said magnitudes defined by a vector $S = [S_1\ S_2\ S_3\ S_4\ S_5\ S_6]$; and deriving the vectors F and T from the mathematical relationship between $F_g = [F_x\ F_y\ F_z\ T_x\ T_y\ T_z]$ and $S = [S_1\ S_2\ S_3\ S_4\ S_5\ S_6]$ for statically determined or else statically non determined structures.

2. Method according to claim 1, characterised in that said measuring structure (12) is applied to said body (11) in a rigid manner.

3. Method according to claim 1, characterised in that said measuring structure (12) is applied to said body

(11) in an elastic manner.

4. Method according to claim 1, characterised in that in a measuring structure (12) comprising three arms (15) carrying at the end (16) said connection elements consisting of spherical joints (17) free to translate in the direction of the axis of the arms (15) thanks to a further slider type binding (18); six bending moments are measured, said six moments being two perpendicular bending moments for each arm.

5. Method according to claim 1, characterised in that in a measuring structure comprising two triangular rigid elements, an upper plate (25) and a lower plate (26), linked together at the respective three vertices (25A, 25B, 25C, 26d, 26e and 26f) through two connecting rods (27) for each vertex, said connecting rods (27) being suitable for joining up two contiguous vertices of the opposite triangle (25, 26) through connection elements realised through spherical joints (17), six axial actions are measured, one for each connecting rod.

6. Method according to claim 1, characterised in that in a measuring structure comprising two triangular rigid elements, an upper plate (25) and a lower plate (26), linked together at the respective three vertices (25A, 25B, 25C, 26d, 26e and 26f) through three shell elements (36) connected to said lower element (25) and upper element (26), respectively, through a hinge and

carriage (37) type binding and a spherical joint (17), three axial actions and three bending moments are measured on three elements.

7. Method according to claim 1, characterised in that said six measurements are carried out through strain gauges (14).

8. Device for measuring forces and moments acting on a body, characterised in that it comprises a measuring structure (12) made up of one or more elements and provided with a plurality of connection elements or bindings (17, 18, 37) for the connection between the elements of the structure (12) and/or a body (11) the subject to generalised forces which one wishes to measure, in which said structure (12) is statically determined or else statically non determined, said structure (12) being equipped with means for measuring (14), in one or more points, six stress and/or deformation magnitudes from which the force vector F and moment vector T acting on the body (11) can be worked out mathematically.

9. Device according to claim 8, characterised in that said structure (12) comprises three arms (15) carrying at the end (16) connection elements consisting of spherical joints (17) free to translate in the direction of the axis of the arms (15) thanks to a further straight slider type binding (18).

10. Device according to claim 9, characterised in that said spherical joints (17) with slider (18) are rigid, each one realised through a self-aligning ball bearings or else radial ball bearings equipped with suitable axial clearance, connected to a slider realised by means of a plain bearing, a ball-circulation sleeve or else a sleeve with balls and/or rollers.

11. Device according to claim 9, characterised in that said spherical joints with slider are rigid, realised through a spherical joint (17) plus a cylindrical plane bearing (18), or through a sphere, or convex element, (17) sliding into a cylindrical element (18).

12. Device according to claim 9, characterised in that said spherical joints (17) with slider (18) consist of an elastic support that is very rigid in its radial direction and very flexible in the other direction comprising an element made from elastomer (19) inserted into one or two containment elements (20), inside which the end (16) of said arm (15) is positioned.

13. Device according to claim 9, characterised in that said spherical joints (17) with slider (18) consist of an elastic Hooke's joint (21) equipped with bushes with zero clearance and friction (23), arranged in series with an elastic cylindrical hinge (22) consisting of a further bush with zero clearance and friction (23),

suitable for realising a spherical joint with practically zero clearance and friction, placed in series with a thin plate with four fixed ends (24) yielding elastically in the axial direction, suitable for realising a slider (18) type binding.

14. Device according to claim 9, characterised in that said arms (15) are each equipped with two pairs of strain gauges (14a, 14b), said measuring means (14) being suitable for measuring two perpendicular bending moments acting at each arm (15).

15. Device according to claim 8, characterised in that said structure comprises two triangular rigid elements, an upper plate (25) and a lower plate (26), bound together at the respective three vertices (25A, 25B, 25C, 26d, 26e and 26f) through two connecting rods (27) for each vertex, said connecting rods (27) being suitable for linking two contiguous vertices of the opposite triangle (25, 26) through connection elements realised through spherical joints (17).

16. Device according to claim 15, characterised in that said spherical joints (17) are rigid and realised through spherical joints, self-aligning bearings or else radial ball bearings designed with suitable clearance.

17. Device according to claim 15, characterised in that said spherical joints (17) are elastic and

realised through elements made from elastomer designed with low stiffness in rotation.

18. Device according to claim 15, characterised in that said spherical joints (17) consist of an elastic Hooke's joint (21) equipped with bushings with zero clearance and friction (23), arranged in series with an elastic cylindrical hinge (22) consisting of a further bushing with zero clearance and friction (23).

19. Device according to claim 15, characterised in that said spherical joints (17) consist of an elastic Hooke's joint with bending elements (28) comprising a cross (33) consisting of two perpendicular arms (34) joined by a spacing cross member (35), in which two pairs of thin plates (31, 32), suitable for realising a double hinge with perpendicular axes and practically zero friction and clearance, are linked to the arms (34).

20. Device according to claim 19, characterised in that said pairs of thin plates (31, 32) are each connected at the opposite end with respect to the cross (33) to a fork element (30) suitable for being made integral with the parts to be interconnected.

21. Device according to claim 15, characterised in that said connecting rods (27) are equipped with means for measuring (14) the axial traction or compression force to which they are subjected.

22. Device according to claim 8, characterised in that said structure (12) comprises two triangular rigid elements, an upper plate (25) and a lower plate (26), bound together at the respective three vertices (25A, 25B, 25C, 26d, 26e and 26f) through three shell elements (36) connected to said lower element (25) and upper element (26), respectively, through a hinge and carriage (37) type binding and a spherical joint (17).

23. Device according to claim 22, characterised in that said hinge and carriage (37) type binding consists of the combination of plain bearings, radial ball bearings or else a sleeve with balls and/or rollers.

24. Device according to claim 22, characterised in that said spherical joints (17) are rigid and realised through spherical joints, self-aligning bearings or else radial ball bearings equipped with suitable clearance.

25. Device according to claim 22, characterised in that said elements (36) are equipped with means (14) for measuring the bending and the axial action to which they are subjected.

26. Elastic Hooke's joint with bending elements (28) comprising a cross (33) consisting of two perpendicular arms (34) joined by a spacing cross member (35), in which two pairs of thin plates (31, 32), suitable for realising a double hinge with perpendicular axes and

practically zero friction and clearance, are fixed to the arms (34).

27. Hooke's joint according to claim 26, characterised in that said pairs of bending elements (31, 32) are each connected at the opposite end with respect to the cross (33) to a fork element (30) suitable for being made integral with the parts to be interconnected.